
Examination of Family Environmental Factors Associated with Obesity in African American Youth Resides in Baltimore City

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Introduction

Obesity is very prevalent in America, making it epidemic (Dalton, 2004). Obesity is the measurement of body fat based on an individual's weight and height (kg/m squared). This measurement is called the Body Mass Index or (BMI). African Americans are at a high risk of developing obesity which is not considered a disease. The World Health Organization states differences in categorizing obesity across ethnicities. National Center of Health Statistics defines obesity for adolescence as a BMI \geq 95th percentile based on their age and sex (CDC, 2008). Obesity is defined for adults as BMI \geq 30 (NCHS, 2007). Obesity affects adult, adolescence and children alike. A study by Ogden et al. (2006) stated more than half of America's adult population, 32.3%, is obese. Statistics for children and adolescence, male and female, are equally alarming at 16.4% (Ogden et al., 2006).

Researchers Freedman et al. (2005) examined the relationship between childhood weight gains leading to adult obesity commonly known as tracking. It has been noted by various studies that adolescent obesity tracks into adulthood (Dalton, 2004; Dietz, 1998; Freedman et al., 2005). Obesity originating from childhood puts individuals at a greater risk for health concerns (Freedman et al, 2005). Understanding the importance of curbing obesity in adolescence so it will not continue throughout an individual's life is crucial. In addition, it is commonly known that obesity leads to a rise in health cost (Dalton, 2004). Some of the health risk associated with obesity are both short and long term. Some health risks are diabetes, cardiovascular disease, high blood pressure, high cholesterol and breathing difficulties or asthma (Dalton, 2004).

As youth transition to adolescence, physical activity levels decline (Kimm et al., 2002) thus creating an ideal situation for weight gain. Weight gain is common during this transition. Moreover, overweight or obese African American adolescent began puberty earlier which leads to decrease activity levels (Dalton, 2004). High School years represent a life stage in which girls, and boys are not engaging in sufficient physical activity. The family environment also plays a huge role in the development of obesity (Kimm et al., 2002). It has been revealed there is a relationship between social environment and its influence in supporting or hindering physical activity.

The following sections will highlight the general topic of the prevalence of obesity, health consequences and family environmental factors that relate to obesity.

Problem Statement

African American adolescents are at a bigger risk for developing obesity than some of their counterparts. African American females are more likely to be obese than White or Hispanics adolescents. African American women are 70% more likely to be obese than Non-Hispanic White women (CDC, 2007). Furthermore, research notes that obesity in adolescence continues into adulthood (Freedman et al, 2005). Understanding the development of obesity in adolescence can possibly curb its continuation into adulthood. Several studies consider the environmental aspects that contribute to obesity in the African American population (Boyington et al., 2008; Kibbe and Offner, 2003 Kimm et al., 2002).

Purpose of Study and Research Questions

Many factors contribute to obesity. The study, however, examines family factors associated with the epidemic. The purpose of the proposed research is to examine the family factors associated with obesity. Some family factors that may contribute to obesity in African American adolescents are: (a) family environment, (b) socioeconomic status, (c) family practices. Given the purpose of the research the research questions are:

1. What family factors may contribute to adolescent obesity?
2. How do family environment, socioeconomic status and support for physical activity contribute to adolescent youth obesity and non obesity?

Significance of Study

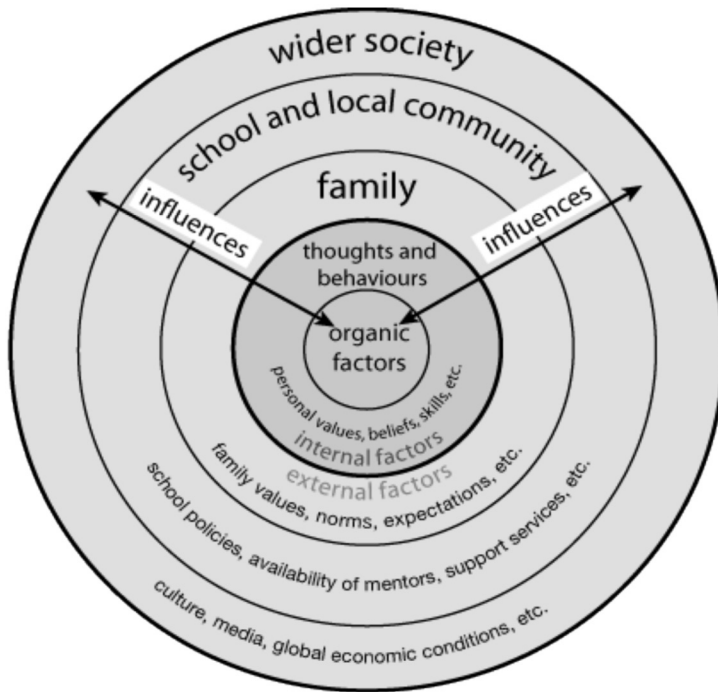
Studying family factors of adolescent obesity is significant due to the current increases of obesity levels. African American obesity levels are increasing significantly, resulting in many health consequences and increase health care cost. Research supports over the last two decades, there has been an upward trends in obesity among adolescents (Kaur, Choi, Mayo, & Harris, 2003).

Theoretical Framework

Some researchers say obesity results from an interplay of multiple factors which include family demographics and parental practices (Mei, et al., 1998). The ecological systems theory effectively frames the topic. Researchers Davison & Birch (2001) analysis Urie Bronfenbrenner's Ecological Systems Theory (1979) in relation to child development. In addition, the framework allows refinement of research questions included in the proposal. The theory defines how complex "layers" of the environment effect child development (Bronfenbrenner, 1979). Their analysis shows the environmental factors associated with childhood/ adolescence

obesity (Davison & Birch, 2001). The four systems described are the Microsystem, Mesosystem, Exosystem, and Macrosystem as Figure 1 displays. The microsystem is the most influential system because the child experiences their first contact with the environment, including interactions with parents (family), school, neighborhoods, and childcare environments. The child and those surroundings both influence each other. For example, a child's parents may affect his or her beliefs and behavior, and vice versa. Another name for this is the *bi-directional influence* (Davison & Birch (2001). Secondly, the microsystem and mesosystem are interrelated. In the mesosystem, family experiences are directly related to experiences outside the initial environment (microsystem). Each aspect of the system shows the connection surrounding the child's teachers, parents, neighborhood, and overall environment. Thirdly, the exosystem describes larger social systems that are not directly in contact with the child. Lastly, the macrosystem consists of cultural values, customs and laws. The system has a distance influence on development of obesity since it is the last level (Davison & Birch 2001).

In addition, the theory has been renamed "*bioecological systems theory*" to emphasize a child's own biology as a primary environment factor influencing development. Their biology in combination with the complex levels plays a role in development. The interaction between factors in the child's biology, immediate surroundings, and the broader societal landscape all influence development (Davison & Birch 2001). The framework effectively explains factors influencing child development that related to obesity. Davison & Birch conclude that the family environment is the strongest factor in the early development of obesity.

Figure 1

Displays the different environmental levels and influences on the child. First two inner rings display the microsystem- child's first environmental contact, mesosystem- immediate environment like family, exosystem-large social systems like school and community, and macrosystem- the wider society.

Literature Review

This chapter will cover obesity, adolescent obesity, and adolescent obesity in adolescence, factors associated with obesity in adolescent, health consequences, parental obesity status, cultural attitudes, and the family environmental factors associated with obesity in adolescent girls. It is evident that many of factors

Literature on Obesity in America

Prevalence of overweight and obesity has increased sharply for both adults and children, since the mid- seventies (CDC, 2008). The National Health and Nutrition Examination Surveys (NHANES) shows that “among adults aged 20–74 years the prevalence of obesity increased from 15.0% (in the 1976–1980 survey) to 32.9% (in the 2003–2004 survey)” (CDC, 2008). For many, adult obesity is a continuation

of a condition that developed as an adolescent (Freedman et al, 2005). Since the condition continues from adolescence then the associated health risk will not only continue, but develop into more serious ones. Many overweight people develop asthma, high blood pressure, high cholesterol and the development of cardiovascular disease (CDC 2007). Not all obese adolescents develop into obese adults, but obese adolescents have a higher risk of becoming obese adults. The health consequences will be discussed more specifically later on in the review.

Health consequences of obesity. Some health concerns surrounding adolescent obesity are asthma, diabetes, and pre-hypertension and colon cancer. Some of these consequences occur naturally out of the environment. As mentioned before, some health risk are diabetes, cardiovascular disease, high blood pressure, and breathing difficulties or asthma (Dalton, 2004). African Americans in particular suffer an increased risk for developing the disease.

In addition, various studies have shown a relation between adolescent obesity and hypertension. This problem needs to be curbed at a young age before it progresses into a mountainous issue (Dietz, 1998 & Freedman et al., 2005. The issue is the development of high blood, pressure and diabetes as an adult (CDC, 2007). It is imperative that the health risks are taken seriously because they have the potential for lasting a lifetime. On the contrary, it has been reported that among the studies revealing childhood obesity tracking in to adulthood, only 15% to 30% results from obesity beginning in adolescence.

Adolescent obesity. “One out of three children in the United States is either overweight or at a serious risk of becoming so” (Dalton, 2004, p.35). The data represents a large number that will continue to increase if something does not change. The following statistics from the Center for Disease Control and Prevention support the notion that obesity starting in adolescence is likely to persist in adulthood, “Obesity is of particular concern for our children, since overweight adolescents have a 70% chance of becoming overweight or obese adults” (CDC, 2008). With that alarming fact, the health risks associated are devastating. The following are some health risks associated with obesity in adolescents: (a) Type 2 diabetes, (b) cardiovascular disease, (c) advance maturation, (d) asthma, (d) gastrointestinal and (e) psychological problems (Vargus, 2006). Vargus’ discussion on the psychological health risk is important. Other researchers agree that adolescent weight gain can lead to other feelings of low self worth, and difficult peer relations (Boyington et al., 2008, Dalton, 2004, Kimm et al., 2002). Alleyne & Lapoint support that obese adolescents that are teased by their peers suffer from low self esteem and self worth (Alleyne & Lapoint, 2008). It is important to understand the social consequences associated with weight gain since it is an ongoing concern. Additionally, adolescents classified as obese have a difficult time socializing with their peers. Some fear that their peers are laughing or mocking their size (Boyington et al., 2008, & Kimm et al, 2002). This is why it is important to understand the impact of the environmental factors having on an adolescent obesity.

Obesity in adolescent girls. Adolescent years create an environment favorable to weight gain. Some girls experience more weight gain than their male counterparts. A study conducted by Dietz (2004), supports that adolescence is a critical period where weight constantly fluctuates:

Adolescence represents a third critical period when overweight may occur and may increase the risks of obesity in adulthood. The risk of becoming overweight during adolescence appears to be higher among girls than among boys, perhaps because adolescence in girls is characterized by a relative increase in fatness. (p.855)

This quote refers to the how girls develop compared to boys. Findings show that girls experience weight gain at a higher rate due to puberty related weight gain compared to their male counterparts. It also shows the long term consequence of adolescence obesity, which is the possible growth into adulthood obesity. Adolescent is a critical period for girls in particular because weight gain is common during puberty (Dalton, 2004). Research conducted in Kimm's study supports that a decline in physical activity is common during adolescent years due to the expected weight gain resulting from puberty for girls (Kimm et al., 2002).

Furthermore, findings of the National Heart, Lung and Blood Institute (NHLBI) reported that in addition to African American children/adolescents being at disproportionate risk, the prevalence of obesity in black girls specifically, is one third higher (31%) in comparison to white girls (Kibbe & Offner, 2003). Clearly, African American adolescent girls are at a high risk for developing obesity. Boyington et al. (2008) and Kimm et al (2002) provide some explanation to why African American girls are at a high risk. Young African American females are less likely to eat the recommended daily amount of fruits, vegetables, and whole grains, and are more likely to consume high amounts of fat and sodium (Boyington et al., 2008, Krebs, 2008 and Kimm et al. 2002). The study further reveals, in contrast, white adolescent girls are shown to eat more of the daily recommended amount of nutrition like the fruit, vegetables, and whole grains. One conclusion of the study is that consumption of these types of food will evidently lead to weight gain (Boyington et al., 2008, and Krebs 2008).

Asian American obesity literature. The World Health Organization has reported Asian youth have a higher risk, compared to other ethnic groups, for developing health problems related to obesity at a lower body fat measure. For example, a 12-year-old Asian boy who is 5 feet tall may be overweight at 125 pounds (BMI 25), and could have the same risk of developing diabetes as a white classmate of the same age and height who weighs much more at 155 pounds (BMI 30).

Factors Associated with Obesity in Adolescent Girls

There are many factors associated with obesity in adolescent girls. Some are (a) diet, (b) physical activity or inactivity, (c) genetics, (d) and Family Environmental characteristics associated

Diet Scientists have reached a consensus that obesity results from an imbalance of an individual's energy intake and energy output (Krebs et al., 2008). High energy intake coupled with low output creates an imbalance which can lead to weight gain. Having a high calorie diet and low physical activity levels is a leading cause of obesity (Krebs et al., 2008). Krebs study explained obesity in it's the simplest form. The amount of calories consumed by boys and girls differ. Studies show that boys eat more than girls. Various studies reveal that when compared to young white females, young African American females are less likely to eat the recommended daily amount of fruits, vegetables, and whole grains, and are more likely to consume high amounts of fat and sodium (Boyington et al, 2008 & Krebs et al., 2008).

Physical Activity There are clear racial and ethnic differences in physical activity levels. African American adolescents have lower levels of physical activity than white and Hispanic adolescents. Statistics from the YRBS, point out that 29.5% of African American adolescents met recommended physical activity levels compared to 38.7% of whites, and 32.9% of Hispanic adolescents (CDC, 2005). The recommended level is at least thirty minutes of sweat producing physical activity. There is a clear difference across ethnicities with activity levels. African American adolescents still lag behind.

Reis (2008) study supported that all racial and ethnic groups had low physical activities however; African American females had the lowest physical activities (Reis, 2008). To maintain a healthy weight it is recommended that adolescents engage in a minimum of thirty minute of moderate to vigorous daily physical activity. Boyington supports that African American adolescent females lag behind in physical activity. This is due to a couple of reasons. Boyington study explains that a large amount of African American girls do not exercise because they do not want to sweat their hair out (Boyington et al., 2008). In the African American community it is common to value your appearance more than physical health. Many of the girls in that study honestly said, "My hair style is an equal exchanged for me not exercising" (Boyington et al., 2008, p.2) Cultural environments play a huge role in whether or not, and how often this population exercises.

Genetics Genes determine if a person is likely to store excess energy from fat as lean muscle. A common saying is that we are fat because it "runs in our genes" (Dalton, 2004, p.46). Common thoughts as those may lead to the belief that weight gain is totally genetic. Genetics alone cannot explain obesity. Dalton suggests that environmental factors are largely associated with the development of an obesity status (Dalton, 2004, p.46). Recent studies conclude genetics only contributes 30% to the issue and 70% is attributed to the environment. One could also say that obesity runs in the environment, like the above statement of it running in our genes.

Some scientist says that certain types of people have a genetic predisposition to become obese aside from those genetic factors. Dalton asserts children are more vulnerable than others in the obesity epidemic. A geneticist J.V. Neel identified the environment changes everyday, faster than our bodies can keep up. The body will have a hard time adapting to the changes leading to excess gain (Dalton, 2004). This environmental as a prime driver of the obesity epidemic is termed the obesogenic environment (Elinder & Jansson, 2008). Obesity had has been link to an environment that cluttered with large portions sizes. There has been a rise in unhealthy food accessibility along with long physical activity levels which are factors related to the genetic aspect of obesity (Elinder & Jansson, 2008). If the environment stays constant then so will a person weight gain or weight lost.

Even though genetics has a role in obesity it only plays a part. The environment has always had a role as this reveals, "Certain genes increase child's potential for becoming fat, and then other factors fall under the nature (environment) category trigger that genetic predisposition until he or she actually becomes overweight" (Dalton, 2004,p.47). Individuals are constantly influenced by the environment in which they live. Simply put it helps shape you and that could not be truer in the obesity epidemic.

Family Environmental Characteristics

Family environment is one of the many determining factors for the rise of obesity among African American girls. Family environments are the key factors in developing food preferences and patterns that shape children's eating habits and physical activity desires. These factors can lead to African Americans girls having healthy or unhealthy weight status (Dalton, 2004 and Kimm et al, 2002). If a family supports sedentary behavior, i.e. watching television compared to going for a walk for instance, there is no push to incorporate physical activity into there daily routine. A study by Granich et al., revealed that less supportive families can show little concern for the level of sedentary activities their children participate in. "Excessive screen based activity" or watching television, as the study reveal, has excessive consequences; one being weight gain and asthma (Granich et al, 2008, abstract). On the other hand, a family supportive of active lifestyle will help lead to an adolescent with a healthy weight.

Especially during early and middle childhood, family environments are the key influencers for the development of food preferences, patterns of food intake, eating styles, and the development of activity preferences and patterns that shape children's developing weight status.

Low Socioeconomic Status Poverty and low education are some other risk factor associated with obesity. Individuals with a low socioeconomic status have a greater likelihood of becoming obese. Federal statistics show that, "23% of white and 34% of black earning 15,000 dollars or less is at risk for obesity" (Dalton, 2004, p.55). She further states that a low income decreases the options for consuming healthy low processed foods. The main concern of these families is to eat. The types of food eaten are of little concern. She also found that since African American

families are more prone to eating low quality high fat foods, they eat the foods they want their children to eat, and less of what they should eat. Fresh fruits and vegetables snacks are snacks they want them to eat (Dalton, 2004).

The families know the foods that are better for their children to consume. Access to these foods is another issue alone. Today's society provides increase access to fast on the go foods. Fast food restaurants and quickie shops are common in many neighborhoods in urban low socioeconomic areas (Boyington et al., 2008). It is easier to access foods that are not a hassle to prepare. Certain areas don't have access to supermarkets providing fresh produce, in comparison to more wealthy areas. It is important to understand how the environment as revealed is negatively associated with obesity in African American adolescent.

Parental Obesity A study supports that parents categorized as obese have relationships with their adolescents which lead to their development of obesity. Kosti et al., (2007) revealed that between school age children and parents there is an association between BMI's of the parent and child (Kosti et al, 2007). This shows that if a parent is obese, [BMI \geq 30] that the adolescent is likely to follow in their footsteps. This study suggests that parents are a strong influential factor when it comes to creating an environment that supports a certain level of health.

Boyington et al., (2008) further revealed that parents initiate the type of eating habits for their children which become the basis for life long eating patterns.

This quote explains how the parents shape the food environment early on in their child's life,

....relatively little research has assessed the extent to which parents (particularly parents who are overweight) select environments that promote overweight among their children. Parents provide food environments for their children's early experiences with food and eating. These family eating environments include parents' own eating behaviors and child-feeding practices. (Birch, 2001, p 894)

The results suggest that parents are critical in shaping their child's early food experiences which can be positive or negative. Parents create the foundation for their children to follow.

Dalton explains that parents eating choices will be reflected in the child's eating habits. There are a few that Dalton discusses like permissive, authoritative, and authoritarian styles about food choices. Parents adopting an authoritarian eating style use commands or coercion to get their children to eat. On the other hand food is commonly used as a reward and punishment (Dalton, 2004). A child's favorite food is used as a reward system; restricting that same food is used as a type of punishment. The notion of "cleaning your plate" commonly aids in overeating, and eventually an overweight status (Dalton, 2004, 79). The child will eat to clean the plate disregarding any recognition of fullness they may have. This behavior is followed because this is what the parents enforced. Another example of a command is "You can not go play if you don't eat all your dinner," showing the negative view of eating created from them that parent environment (Dalton, 2004, p.79). This

environments is one where overeating is subconsciously encouraged through those types of commands.

Cultural Attitudes toward Obesity Davis et al. study reveals African American parent view on obesity. The parents of obese children explain their child's condition with the term big boned, explaining that his or her takes after them, or it was caused by DNA (Davis, et al., 2008). Culturally, African Americans use the term "big bone" as an acceptable explanation to their child weight status. Some parents may not know all the consequences associated, but when provided with that information the parents quickly began to change the family environment. In addition, many African American families view obesity as not a huge concern. Moreover, any families view slight weight gain as healthy (Davis et al., 2008). The parent's perceptions need to be altered. If the parent continues to think that same ways the consequences related to obesity will never change.

Family Support for Physical Activity Families that openly support physical activity play a huge role in whether or not; the individual develops obesity (Kimm et al., 2002; Kuo, 2007 & Ries, 2008). If there are few opportunities for physical activity combined with unhealthy eating habits like over eating, obesity is likely to occur. Research indicates that recent increases in obesity are likely to result from the interaction of biological and social factors within a physical environment. This coupled with few opportunities for physical activity along with and eating excessive amounts of high calorie foods is associated with weight (Jebb, 1999, p.341).

There has been a great deal of focus on childhood obesity. According to Dietz (2004), during this time one would think that parents would naturally be more supportive of adolescent physical activities (Dietz, 2004). If the parents and family show interest in activities their adolescents are involved in, they would have more motivation to be active. Kuo et al (2007) further revealed the level at which the family environment can act as a determinate or motivation factor in contributing to physical activity (Kuo et al., 2007). A family that is supportive of active lifestyles will create an atmosphere where an individual is more prone and eager to participant in physical activity.

Summary and Implications of the Literature

Researching youth obesity specifically in the Baltimore area has proven difficult. Strength is that youth obesity in general is a widely researched topic creating abundant sources of information. The measures set to be used in the future study are family intimacy, family environment and family physical activity. The family intimacy scale is very important environmental characteristic when predicting levels of physical activity/non activity in the high school girls but it is not commonly well defined. In contrast, strength is there have not been many studies with predominately African American adolescent. The sample sizes are usually a mix of minority populations. This study will add to the current established literature.

Research Methods

An extensive literature review was conducted on the topic of adolescent obesity. Utilizing the research port www.lib.umd.edu to accumulate information on African American Adolescent obesity was essential to the completion of the paper. Some key search words used are family environment and adolescent obesity trends, urban areas, sedentary behavior and physical activity levels. The Journal of Pediatrics, Obesity Research, PubMed and Academic Search Premier were all utilized to compile the paper. Furthermore, the questionnaires will be Likert Scale based with the foundation of Scale Family Environmental Scale (Moos, 1974). The family environmental scale has various subscales that examine certain aspects of family life.

A qualitative study will be conducted at a local area high school in Baltimore city. Questionnaires will be distributed at the high school and will be voluntary. Parents and children were surveyed about family characteristics, family cohesiveness, parenting practices, sibling and family influences, and access in the home environment to sedentary pursuits. Below are examples of the measures assessed in the questionnaires.

Measures

Data were collected using questionnaires created specifically for each variable. Height and weight was also collected using standard measures. These reliable and valid measures have been tested in previous studies (Young et al., 2006). The family environment variables are family intimacy, family environment, parent obesity status and family support for physical activity.

Family Intimacy

The family intimacy questionnaire (Moos, 1974) consisting of five questions, was measured using the 5-point Likert Scale with (1) strongly agrees through (5) strongly disagree (Dickerson et al, 1996). It proved very effective. The following is an example of a statement: *My family spends a great deal of time in activities that we enjoy doing together.* In addition, Questions 1 and 2 were reverse coded so the response would remain positive.

Family Environment

One questionnaire addressed the family environment with twenty- seven questions that followed rating of true /false (Moos, 1974). Questions are grouped in these categories: cohesion, conflict, active recreational orientation (ARO) with nine questions falling under each (Moos, 1974). The responses from that questionnaire revealed how the participants viewed their families. Some questions also had reversed coding to keep outcomes positive. Two examples of a question that would yield a positive response are (a) *Family members really help add support for one another* T (1) or F(0), and (b) *Family members hardly ever lose their tempers* (Moos, 1974). The statements overall gave a good description of how the girls viewed their family environment.

Family Support for Physical Activity

Another questionnaire assesses family support for physical activity. Questions were structured around the support given to the girls within the past month. Some were reversed coded to keep the responses positive. Thirteen questions were asked and measured using the 5- point scale with (1) never, (2) rarely, (3) a few times, (4) often, and (5) very often (Dickinson, et al). Examples of questions are: (a) “*During the last month, my family or members of the household exercised with me*” and (b) “*During the past month, my family members changed their schedule so we can exercise together* (Young et al, 2006). The questions addressed data revealing family receptiveness and attitudes toward exercising. Understanding how the family supports exercise creates a better look into the environmental effects.

Parent Obesity

Parent obesity has a strong relationship with adolescent obesity. A medical history table was distributed to gather information on various medical conditions for the mother, father, grandparent, and brother or sister. The various medical conditions are heart disease, stroke, high blood pressure, diabetes, anemia, and overweight or obesity, (Young et al 2006). The girls’ responses of the parents (mother and father) obesity status were used in the data analysis. The responses categorized as follows: *Yes (1) obese, No (2) not obese, Don’t know (9)* (Young et al, 2006).

The above measures have been used in many similar research studies and have proven to be very reliable and valid.

